

47

of the synthetic cathinone in the sample by a signal generated upon binding of the synthetic cathinone to the aptamer.

8. The method according to claim 7, the dye being Cy7.

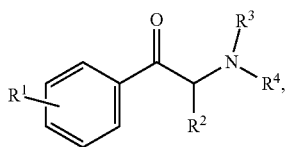
9. The method according to claim 7, the sample being a biological sample or an environmental sample.

10. The method according to claim 9, the biological sample being selected from blood, plasma, urine, tears, sweat, and saliva.

11. The method according to claim 7, the cross-reactive aptamer comprising SEQ ID NO: 6, 18 or 19.

12. The method according to claim 7, wherein the signal generated upon binding of the synthetic cathinone to the aptamer can be observed by the naked-eye.

13. The method according to claim 7, the synthetic cathinone having a core structure of



48

wherein R<sup>1</sup> is selected from the group consisting of hydrogen, alkyl, aryl, heteroaryl, cycloalkyl, cycloalkenyl, heterocycloalkyl, alkenyl, alkynyl, alkoxy, haloalkyl, acyl, halogen, and hydroxylalkyl, or R<sup>1</sup>, taken together with the carbon atom to which it is attached and an adjacent carbon atom, form a substituted or unsubstituted 5- or 6-membered homocyclic or heterocyclic ring;

R<sup>2</sup> is hydrogen or alkyl; and

R<sup>3</sup> and R<sup>4</sup> are each independently selected from the group consisting of hydrogen, alkyl, aryl, heteroaryl, cycloalkyl, cycloalkenyl, heterocycloalkyl, alkenyl, alkynyl, haloalkyl, acyl, halogen, and hydroxylalkyl, or R<sup>3</sup> and R<sup>4</sup>, taken together with the nitrogen atom to which they are attached, form a substituted or unsubstituted 5- or 6-membered heterocyclic ring.

14. The method according to claim 13, the synthetic cathinones being selected from MDPV; α-PVP; pyrovalerone; methylone; pentylone; MDPBP; mephedrone; MPBP; MPHP; naphyrone; methedrone; ethylone; butylone; 4-MMC; 4-FMC; 3-FMC; methcathinone; and MEPBP.

\* \* \* \* \*